in fact, the appearance of a roof covered with overlapping rounded tiles, with the triply-arranged bundles of hair growing between each "tile." Moreover, when seen in cross-section, the skin is observed to be thrown into a series of ridges or steps, each of which represents the free edge of one of the "tiles." To explain such a structure otherwise than as representing the bed of a scaly armour seems impossible, or at all events illogical, and we are accordingly compelled to accept the author's view that the fox is descended from scale-clad ancestors. No actual traces of scales have been observed in any of the skins yet examined, but Dr. Toldt suggests that such might be detected if a large series of skins of young fox-cubs were examined under proper conditions.

Although no mention of this point is made by the author of the paper referred to, the fox is just one of those animals which might naturally be expected to retain traces of its descent from reptilian ancestors. There is good reason to believe that the extinct mammal-like reptiles of South Africa were the immediate forerunners of the primitive carnivora or creodonts of the Tertiary period; while it is certain that from these latter are descended the modern carnivora, among which the fox, in common with the other members of the dog tribe, is one of the most primitive and least specialised representatives.

NOTES.

A STATUE to Bunsen, raised by public subscription, will be unveiled at Heidelberg on August 1.

WE regret to see the announcement of the death of Lord Blythswood, F.R.S., at seventy-one years of age.

SIR WILLIAM H. WHITE, K.C.B., F.R.S., has been elected chairman of the council of the Royal Society of Arts for the ensuing year.

PROF. GEORGE HALE, director of the Mount Wilson Observatory, California, has been elected a foreign correspondant in the astronomical section of the Paris Academy of Sciences in succession to the late Prof. Asaph Hall.

DR. BOUCHARD has been elected president of the Paris Academy of Sciences in succession to M. H. Becquerel, who was recently appointed permanent secretary of the academy. Prof. Emile Picard succeeds Dr. Bouchard as vice-president.

THE congress of meteorologists representative of the United Kingdom and of the British colonies and dependencies, which it was proposed to hold in Quebec in the last week of this month, has been postponed until next year.

THE well-known expert on turbines and hydraulic engineering, Prof. A. Stodola, of the Zürich Polytechnic College, has been awarded the Grashof gold medal of the Society of German Engineers.

THE council of the Society of Engineers and the council of the Civil and Mechanical Engineers' Society have approved a scheme of amalgamation which is expected to meet with the cordial support of the members of both bodies. This is a welcome innovation in the policy of technical societies, as of late years there has been a growing tendency to form new societies, and the consequent overlapping of work has rendered bibliographical research increasingly difficult.

A THOROUGHLY representative exhibition of mining machinery was opened at Olympia by Lord Strathcona on July 11. An interesting popular feature of the exhibition, which will remain open until July 31, is a series of realistic scenes giving an excellent idea of the practical working side of the Empire's mining industries. These scenes represent prospecting for diamonds in South Africa, gold mining in the Transvaal, alluvial gold mining in the Klondyke, hydraulic gold mining in New Zealand, tin mining, coal mining, granite quarrying, and Bath-stone mining.

IN the House of Commons on July 8, Mr. Dundas White asked the Prime Minister whether the Government would give facilities for the passing this session of the Daylight Saving Bill, now entitled the Local Time (Great Britain and Ireland) Bill; and, if so, whether the Government would propose amendments making clear that the adoption of the proposed modification of time was not compulsory, and substituting for the term local time some less ambiguous term. In reply, Mr. Asquith said:—"The Government have no intention of giving facilities for the passing of the Daylight Saving Bill."

IN the Chancery Division of the High Court, Mr. Justice Eve has just decided that china clay is a mineral within the meaning of the Railway Clauses Consolidation Act, 1845. The right to work china clay in some land purchased by the Great Western Railway Co. was claimed by the vendor to the company and owner of the adjoining land. Notice of this claim was given to the railway company, which brought the action for an injunction to restrain the owner from excavating the land near and under their line in Cornwall to get china clay, on the ground that the product obtained was not a mineral in the sense of the Act of 1845. Mr. Justice Eve, however, decided against this view, and gave judgment for the defendents. A full report of the judgment appears in Wednesday's *Times*.

WITH a view to obtain accurate information regarding the nature and extent of the damage done by rats in the United Kingdom, the committee of the Society for the Destruction of Vermin has prepared a schedule of questions for wide distribution. It is desired to obtain information from all persons who are in a position from their own experience to give particulars concerning temporary or permanent rat plagues, the damage done by rats, the steps taken to prevent such damage, and the results obtained. The secretary of the society, Mr. A. E. Moore, 95 Wigmore Street, London, W., will be glad to send a copy of the schedule of questions to any person who is able and willing to send information.

THE Paris correspondent of the *Times* announces that M. Henri Deutsch de la Meurthe has offered a new prize of 1000*l.* for the first aërial automobile apparatus, either lighter or heavier than air, which will transport Commandant Renard to England. If he is conveyed by an automobile balloon, the descent must be made at Aldershot Camp. If he goes on an aëroplane, however, it will only be necessary to reach the English coast. From the same source we learn that Commandant Renard, in some comments on the recent exploits of Mr. Henry Farman at Issy les Moulineaux and of M. Delagrange in Rome, referred to the fact that both aëronauts have remained more than fifteen minutes in the air, and remarked, "In less than two years the distance traversed by an aëroplane has passed from twenty-five mètres—the famous preliminary bound of M. Santos Dumont in October, 1906—to nearly twenty kilomètres, a proportion of 1 to 800." At that rate, within two years it will be possible to make journeys of twenty days without stopping. At all events, there is nothing extraordinary, says Commandant Renard, in thinking that journeys of several hours, and even of an entire day, will soon become quite normal.

THE *Comptes rendus* of the Paris Academy of Sciences for June 29 contains the report of the committee appointed to consider the distribution of the Bonaparte fund for 1908. The committee has considered 107 applications for assistance from this research fund. Some of these, it is mentioned, do not comply with the conditions laid down by the founder, Prince Roland Bonaparte, and others are for work entirely outside the field of the Academy of Sciences. The committee excludes also demands for assistance in researches in medicine, surgery, and general biology, since the funds of the *Caisse des Recherches scientifiques* are exclusively reserved for biological studies. Ten grants are recommended as follows :—(1) 2000 francs to L. Blaringhem for a continuation of his important studies on the variation of species and the experimental methods for the creation of new species of plants; (2) 2000 francs to Dr. Billard to enable him to pursue his studies on the hydroïds; (3) 2000 francs to Dr. Estanave to furnish him with the means of continuing his researches on direct vision projection in relief, with special reference to radiography; (4) 2500 francs to MM. Fabry and Buisson for a continuation of their work on the establishment of a system of standard wave-lengths. The grant is to be applied to the purchase of a plane grating, a metal concave mirror of large diameter, and two plane mirrors required for a study of the differences between the lines of the solar spectrum and those of the electric arc; (5) 5000 francs to M. Gonnessiat for the purchase of astronomical instruments for the observatory of Algiers; (6) 2000 francs to Dr. Loisel for the continuation of his actinometric observations at the Observatory of Juvisy; (7) 2000 francs to M. Dongier for the establishment of apparatus for the simultaneous study of the rainfall and atmospheric potential; (8) 2500 francs to M. Perot for the spectroscopic study of the light from the sun by interferential methods; (9) 2000 francs to M. Matignon for the determination of specific heats at high temperatures; (10) 3000 francs to P. Colin for the publication of a map of South Imerina. These recommendations were adopted by the academy.

THE "Brisbane beds" of Queensland, at one time supposed to be of Jurassic age, form the subject of an article by Mr. S. B. J. Skertchly in the first number of a new serial, the *Queensland Naturalist*. Their plant-remains prove them to be of early Tertiary age—perhaps equivalent in time to the Laramie beds of the United States.

AMONG other American papers, we have to acknowledge the receipt of one by Mr. C. S. Townsend on the taxonomy of the more typical flies, with descriptions of new genera and species, forming part of vol. li. of Smithsonian Miscellaneous Contributions; also one by Alice Robinson, issued as No. 5 of vol. iv. of the Zoological Publications of California, on the incrusting chilostomatous bryozoans of the Pacific coast of North America.

IN an article communicated to the current volume of the Journal of the Asiatic Society of Bengal, Mr. R. B. Sanyal urges the importance of establishing an aquarium for scientific research in Bengal. The author quotes Lieut.-Colonel Alcock to the effect that the ideal situation for such an establishment would be the Orissa coast, in the immediate neighbourhood of the sanatorium at Puri. With some modification of the salt-excise, it is believed that a fishing and dredging station on this coast would yield a large revenue from dried fish, fish-oil, isinglass, &c., while from the scientific point of view such an establishment would almost certainly result in discoveries of profound interest and importance.

WE have to acknowledge the receipt of four parts (vol. xxiii., Nos. 5–8) of the Journal of the College of Science, Imperial University of Tokyo. No. 5 is devoted to the appendicularians (such as Kowalevskia, Fritillaria, and Oikopleura) met with in Japanese waters in the Noctiluca-plankton, the author, Mr. T. Aida, giving elaborate details of their anatomy. New cicadas from Europe and the Mediterranean region generally are described by Dr. S. Matsumura in No. 6, while in No. 7 Mr. S. Tanaka gives descriptions of fourteen Japanese fishes regarded as new. Finally, in No. 8, Mr. I. Ikeda gives full details of the structure of three remarkable forms of Japanese echiurid gephyrean worms of which preliminary descriptions have appeared elsewhere. The paper is illustrated by four plates, of which the first is coloured.

THE first article, comprising 360 pages, of vol. viii. of the Bulletin of the Illinois State Laboratory is devoted to the organisms and their seasonal distribution of the plankton of the Illinois River, based on the results of observations and collections made from 1894–9. The plankton of fresh waters, observes the author, Dr. C. A. Kofoid, differs from that of the sea in the almost universal absence of larval forms of life, in the smaller number of invertebrate groups represented, and in the smaller size of the species. Notwithstanding this lack of the larger forms, the Illinois plankton represents a larger quantitative amount of organic matter per cubic metre of water than is the case with marine plankton. The relative abundance of diatoms, of green and blue-green algas, and of chlorophyll-bearing flagellates, apparently affords abundant sustenance for the animal section of the plankton.

IT has long been a puzzle how the "oystercatcher" opens the shells of the mussels which form its main diet. The question has been set at rest by an article contributed by Mr. J. M. Dewar to the June number of the *Zoologist*. The great majority of the molluscs are opened from the dorsal border, when the valves are gaping, by the bird thrusting its beak into the aperture and then using it as a lever, at the same time severing the adductor muscles. If one of the valves be fractured in the process, the lever-action becomes unnecessary. About 9 per cent. of the mussels are opened on the ventral border, where the aperture for the byssus renders them as vulnerable when the valves are closed as when open. Mussels presenting this aspect are carefully searched for by the birds. Finally, about 13 per cent. of the mussels are attacked at the posterior extremity of the shell.

IN a special report issued by the Government of Egypt, Captain Stanley Flower has published an account of his round of visits to the menageries, aquariums, and museums of Europe in 1907 for the purpose of acquiring information which might prove advantageous to the establishment under his care at Giza. Much of the interest of the report is centred on the notices of local and private collections of which the general public knows but little. Among the latter, special reference may be made to the wonderful collection of living fresh-water fishes maintained by Captain J. A. M. Vipan in two special buildings in the garden at Stiblington Hall, near Peterborough. Among the rarities in this collection may be mentioned specimens of the bichir (Polypterus) from the Gambia, and Russian sterlets presented by H.I.M. the Czar of Russia. Mr. F. E. Blaauw's collection of mammals and birds at Gooliust, near Hilversham, also comes in for commendation. The report concludes with a list of the antelopes seen by the author in the course of his tour and one of those now living in the Giza Gardens. Captain Flower, we notice, uses the name *Portax picta* for the nilgai and *Oreas canna* for the eland, thereby demonstrating that modern emendations in nomenclature are still by no means universally accepted.

We have also received a copy of the report of the Giza Zoological Gardens for 1907, illustrated with a coloured plan. The year appears to have been an unusually successful one, the number of visitors and the amount of money taken at the gates being in excess of any previous season. Captain Flower directs special attention to the circumstance that both kudu and addax have bred in the menagerie.

A flora of the Austrian Duchy of Styria, "Flora von Steiermark," prepared by Dr. A. von Hayek, is announced by the publishing firm of Gebrüder Borntraeger. To the special section consisting of an enumeration of the plants will be added a general survey of plant distribution in the duchy and in neighbouring countries. The work is to appear in about eighteen monthly parts, each costing three marks. The first part contains the pteridophytes and a few pages of the gymnosperms. The features of the work are the analytical keys to the orders, genera and species, brief diagnoses and localities for each genus and species, and references to literature. Considerable interest attaches to the flora, as certain ranges of the eastern Alps lie within the province, and the vegetation in the lowlands shows affinities with the flora of Illyria.

A short account—accompanied by excellent illustrations—of the anatomical features of the extranuptial nectaries of certain plants is contributed by Mr. K. Ono to the Journal of the Royal College of Science, Tokyo (vol. xxiii., article 3). On the ground of development, the writer distinguishes two types of nectaries, those derived from epidermal cells only, as in species of Polygonum, and those derived from both hypodermal and epidermal cells. It is stated that in some cases the secretion from the glandular cells is forced into a space between them and the cuticle, until finally the liquid escapes by rupture of the cuticle; in other cases it is believed that the secretion permeates the cuticle. Physiological experiments indicated that the secretion is mainly controlled by internal conditions, and that of external factors moisture is the most important.

The idea has been mooted, and has met with some measure of acceptance, that as agricultural land after a repetition of crops of any given species becomes unsuited to the requirements of that species, so, after a proportionately long period, on land bearing pure forest, the seedlings of the crop may eventually fail owing to changes in the properties of the soil. In this connection, Mr. B. O. Coventry contributes an article on alternation of forest crops to the June number of the *Indian Forester*. He instances the observed failure of natural reproduction of the blue pine, *Pinus excelsa*, under its own cover with the incursion of deodar, also the gradual extension of mulberry into a Punjab plantation where originally "shisham," *Dalbergia sissoo*, was dominant. In the North-West Provinces, at a high level, it has been noted that *Quercus incana* is invading the domain of *Pinus longifolia*, and blue pine is advancing into the oak; at another level, *Quercus semicarpifolia* is losing ground to spruce and silver fir. The subject is one that deserves the attention of foresters.

The attention of geologists may be profitably directed to two important papers on the submarine stratigraphy of the English Channel, published in the Journal of the Marine Biological Association of the United Kingdom, vol. viii., No. 2, in May of the present year. Mr. L. R. Crawshay (p. 99) discusses the conditions under which the stones and gravel on the Channel floor become exposed by a constant drift of the fine material towards the English coast. Mr. R. Hansford Worth contributes (pp. 118–188) a critical review of a large number of specimens dredged up by Mr. Crawshay on the S.S. *Oithona* in 1906, and also describes those collected by previous observers, including his own published work of 1899. The greatest interest centres in the discovery of true chalk, in addition to numerous flints, in the region south of the Eddystone. Flints occur, indeed, in practically all the dredgings. One block of foraminiferal limestone, with Miliolinas, clearly of Eocene age, was found in mid-channel off the Lizard, providing a valuable argument for those who view the Parisian *Calcaire grossier* as having been deposited in a sea spreading eastward from the Atlantic. Mr. Worth brings his conclusions together in the form of an interesting geological history of the depression which resulted in the English Channel.

In *Meteorologische Zeitschrift* for May, Dr. J. Hann contributed an interesting paper on the problem of the vertical distribution of sea temperature in the eastern Mediterranean. He asks what conceivable physical process would allow the surface temperature to penetrate to a depth of about 500 metres, as has sometimes been assumed, in the period of half a year; the chief object of the paper is to raise a discussion on this question. Dr. Hann thinks that the lower limit of vertical circulation might be assumed to be about 100 metres, and that we should then have to distinguish between three different strata of temperature:—(1) the superficial, to a depth of about 100 metres; (2) from about 500 metres to the bottom, where the temperature is nearly uniform (14° C. to 13°·5 C.); and (3) the intervening space from, say, 100 to 500 metres.

We have received vol. xlix., part ii., of the Annals of Harvard College Observatory, containing meteorological observations at eight auxiliary stations in Peru for the years 1892–5 from records of self-registering instruments. Although these records are not complete, especially at the mountain stations, where the difficulties of carrying on observations at such great altitudes are considerable, meteorologists are much indebted to the authorities of the college for this valuable contribution, which has been very carefully prepared for publication by Prof. Bailey under the direction of Prof. Pickering. In general, only the hourly means and extreme values for each month are given, but for the mountain stations individual readings are published. The observations at Arequipa for the same period were contained in part i. (to which we have already referred), and the eye observations, with descriptions of the stations and an account of the difficulties connected with them, were given in vol. xxxix., parts i. and ii.

Statistics issued by the Home Office show that the total production of coal in the United Kingdom last year was 267,830,962 tons, which is an increase of 16,763,334 tons over that of the previous year. The death-rate from accidents of underground and surface workers as a whole was 1·32 per 1000.

The Marine Department of the Board of Trade has issued a circular (No. 1443) dealing with the manufacture and testing of steel. The instructions given are based on the reports of the Engineering Standards Committee, and deal with the testing of steel for use in boilers, plates, angle, rivet and stay bars, steel forgings, and steel castings.

In the *Engineering Magazine* (vol. xxxv., No. 3) Mr. H. T. Wade gives an illustrated description of an interesting exhibition, designed to show the best methods of safeguarding workmen and of protecting the general public, which was recently held in New York by the American Museum of Safety Devices and Industrial Hygiene. The exhibition was of great importance in showing that much of the loss of life in industrial operations in the United States is preventable, and that there are already developed methods and appliances that accomplish much in this direction.

The Zoelly turbine is the youngest of the steam-turbines which have risen to any degree of commercial importance, and in view of the fact that it entered a field already occupied by powerful interests and well-established rivals, its progress has been remarkable. Designed by M. Heinrich Zoelly, of Zurich, it was first put on the market in 1904, and has since then been most energetically developed, particularly on the continent of Europe. It is of the compound impulse type, that is, the steam is expanded successively through small ranges of pressure, the velocity acquired during each expansion being utilised by a separate single wheel. Each wheel runs in a compartment by itself, the number of wheels required being determined by the range of expansion through which the turbine has to work, the pressure in each compartment being never less than 58 per cent. of that in the previous one. This limitation enables the full expansion at every stage to be obtained with simple convergent nozzles, which are easier to design and more efficient than the flared nozzles, which become necessary with greater expansion ratios. An exhaustive description of this turbine is given in *Engineering* of July 3, with dimensioned drawings and reproductions of photographs of the 210 horse-power Zoelly turbine direct-coupled to a centrifugal pump shown by Messrs. Mather and Platt at the Franco-British Exhibition.

Messrs. Negretti and Zambra have submitted to us for examination their new prismatic binocular, the "Minim," which they have recently issued. The distinguishing features of the new glass are its compactness, lightness, and small bulk. Its weight is only 10 oz., and it is as small as any other prismatic binocular of the same power, the height being only $3\frac{3}{8}$ inches. These points, however, have evidently been attained without any sacrifice of the essential rigidity of an instrument of such high power. The makers state in their specification that, in order to secure this compactness, lightness, and small bulk, in conjunction with so powerful a magnification as eight diameters, it is of course necessary that the lenses and prisms must be small, and that in consequence the light-transmitting power will, under certain conditions, be smaller than with glasses having large lenses. These conditions, however, are not likely to occur often enough to compensate for a conveniently portable instrument, and on an average day the "Minim" gives ample illumination. The size and shape are such that the binocular can be easily kept in the pocket, and for this purpose it can be supplied in a soft leather case instead of the usual stiff leather sling-case. It is constructed with a well-designed rack focus adjustment on the differential screw principle, giving very easy motion which can be operated by one finger, and which has the additional advantage of not wearing slack with continued use. One eye-lens is separately adjustable for the correction of anisometropia, and both tubes are on the usual swing pivot for adjustment of pupillary distance. The power of eight diameters magnification has been chosen after careful consideration as being the best for ordinary requirements, such as touring and every kind of sport; at the same time, it is not too high for marine work, and is about the limit for holding steady without any subsidiary support. We have also found it extremely useful for many objects in astronomy; for instance, the views of the half-moon on a clear night are magnificent. The general performance of the glass satisfies all of a series of tests on various objects which we have tried. The optical definition is very fine, a pleasing feature being the instantaneous change on either side of the best focus. The images are pleasingly achromatic. We would urge on users of all prismatic binoculars or high-power telescopes that to get critical definition it is necessary to re-focus whenever the distance of the object being viewed is changed, as these instruments have not the latitude in depth of field to which we are accustomed in the ordinary opera-glass of low power.

The last number of the Proceedings of the Royal Society of Edinburgh (vol. xxviii., part iv.) includes a paper of forty-three pages on the problem of a spherical gaseous nebula, continuing and completing Lord Kelvin's work upon this subject. In his last paper, a contribution to Nature of February 14, 1907, Lord Kelvin directed attention to what he called the curious "Perry theorem," which ought to be called the Ritter theorem, namely, that a spherical mass of gas of which the specific heat ratio is less than $1\frac{1}{3}$ must be unstable. What makes a paper of this kind particularly interesting is that Lord Kelvin never satisfied himself with a mere mathematical statement of such a theorem as this; he always sought out the physical meaning of it. It may be said that the paper gives a complete statement of the development of the past work of Lord Kelvin himself, also of Homer Lane, and of Ritter and Perry. It was left incomplete by the author, and it has been well edited by his secretary, Mr. George Green, who has given much time to the calculation of many useful tables of figures.

Messrs. Aston and Mander submit for examination a specimen of the "Compton" slide-rule, which they are selling at nine shillings. As is now universal, the divided surfaces are on white celluloid, and a glass cursor with one cross-line is provided. The radius of the A and D lines are 125 and 250 millimetres respectively, as is usual with rules about 10 inches long. The sine and tangent lines at the back of the slide are graduated from the same end, and in order to be able to read both sines and tangents, or to execute proportions in which one or other come in as factors, without shifting the slide, the slide when reversed is the right way end for end for both at the same time. Of course, as the tangents with this arrangement are read against the D line, they are on twice the scale, and may be read with twice the accuracy. The wood is mahogany, and two celluloid strips are used to face the thin portion of the rule. The two edges are divided, and the inside has the linear divisions continued after the manner of a hat measure. The divisions are fine and accurate, and the working easy and smooth.

The three articles on the work done at the Physikalisch-Technische Reichsanstalt at Charlottenberg during the year 1907, which appeared in the April, May, and June numbers of the *Zeitschrift für Instrumentenkunde*, have now been issued separately, and form very interesting reading. Sufficient information is given to allow the reader to understand the work done and the methods used, and in many cases in which apparatus of a novel kind has been used a figure of it is given. It is scarcely necessary to say that the work is of the highest order, and affords ample evidence of the close association of the institution with the manufacturers of Germany. The idea of publishing in the technical Press an account of work done is a good one, and might well be followed by similar institutions with which manufacturers have not yet learnt to cooperate as much as they might.

THE *Physikalische Zeitschrift* for July 1 contains an account of some observations made by Dr. S. Landau, of Göttingen, on the magnetic rotation of the plane of polarisation in rock salt, Iceland spar, water, and alcohol, with the view of testing the theories which have been advanced in explanation of the phenomenon. His method is a photographic one, the light from an iron arc passing through a polarising prism, the magnetic field, a half-shadow prism, and a spectrograph in succession, the slit of the latter instrument being at right angles to the dividing line of the half-shadow field. Several photographs are taken on the same plate, the polarising prism being rotated through a small angle between each, and from inspection of these the position of the prism for equal intensity of the two halves of a line in any part of the spectrum is found. The author concludes that the electron theory is capable of reproducing all his observations, but that some of the constants which, if only negative electrons are assumed to play a part in the phenomenon, should come out positive, have negative values, and suggest, therefore, that the positive electrons play a part. Against this, however, many objections may be raised.

IN the note upon the seventh International Congress of Applied Chemistry in last week's NATURE (p. 229), it should have been stated that Sir William Ramsay, K.C.B., F.R.S., will be the acting president of the congress, and Sir Henry Roscoe the honorary president. We are informed that Prof. Nasini will not give one of the lectures to the congress, but a lecture will be given by Prof. Paterno, of Rome.

IN the issue of NATURE for June 2, 1904 (vol. lxx., p. 107), an optical illusion observed by Dr. T. Terada, of the College of Science, Tokyo, was described. Dr. Terada directs attention to another illusion he has remarked. After watching drops falling at the rate of about one a second into the centre of a small pool, and so causing circular ripples, he turned his eyes to a spot on a neighbouring bush. The bush appeared to contract slowly towards the point looked at, but the contracting motion was slower than the diverging motion of the ripples. A similar effect was noticed by looking at the ground or at a wall.

OUR ASTRONOMICAL COLUMN.

SATURN'S RINGS.—The June number of the *Astrophysical Journal* (vol. xxvii., No. 5, p. 363) contains a note by Prof. Wright in which he discusses the bright beads, or knots, which were observed during the recent opposition when the unilluminated surfaces of the rings were turned earthwards. Criticising Prof. Barnard's recent explanation, in which the author supposed the brightness of the beads to be due to light percolating by many reflections through the masses of meteorites composing the rings, he points out that whilst this is probably true for the crape ring, it seems impossible that sufficient light to produce the outer bright knots could pass between the more densely packed meteorites of the outer rings. Then turning to Bond's explanation of the phenomena, Prof. Wright shows that it accounts for the bright outer knots and for the very slight asymmetry which is suggested by comparing the measures of different observers. He further suggests that it is not unlikely that collisions among the meteorites may account for some, at least, of the observed luminosity over the surfaces of the two dense rings and in the knots.

NEW PHOTOGRAPHIC CELESTIAL CHARTS.—On a supplementary sheet to No. 4257 of the *Astronomische Nachrichten,* Prof. Johann Palisa invites subscriptions to a series of photographic star charts prepared by Prof. Max Wolf at Heidelberg. Having received copies of his maps privately from Prof. Wolf, Prof. Palisa found that his work of finding minor planets was reduced by 75 per cent., so he suggested that the sheets should be published, as they will undoubtedly prove very useful in other branches of astronomy. The sheets will be printed on smooth matte bromide paper with a degree *reseau,* and each sheet will include some fifty square degrees, the scale being such that 1°=36 mm. This enterprise is purely a private one, of which the cost must be borne by the subscribers, so that Prof. Palisa invites all who wish to subscribe to apply to him as soon as possible, and before December 31 at the latest; the price of the series containing twenty sheets is thirty shillings, and after the date named must be forty shillings. The maps reproduce stars down to about the fourteenth magnitude.

DOUBLE STARS.—An example of the good work that may be done by an amateur astronomer with but a moderate-sized instrument appears in No. 4259 of the *Astronomische Nachrichten,* where a list of double stars discovered and observed by Mr. E. D. Roe, jun., of Syracuse, N.Y. (U.S.A.), with a 6½-inch Clark refractor, is published. His observatory was erected in July, 1906, and by the end of 1907 he had independently discovered some 250 double stars (generally separated by less than 10″), of which he has since identified a number with doubles given by Prof. Burnham. The present list contains the measures of the stars thus identified.

In the same journal Herr J. Fr. Schroeter publishes a list of corrections to Prof. Burnham's "General Catalogue" for double stars included in the Christiania zone.

No. 4260 of the *Astronomische Nachrichten* (p. 185, July 3) contains a discussion by Herr E. Schoenberg, of Dorpat, of the orbits of several double stars, including β 581, β 883, 8 Sextantis=AC.5, and β 612.

THE ALBEDOES OF JUPITER'S FIRST AND THIRD SATELLITES.—In the July number of the *Bulletin de la Société astronomique de France,* M. Quénisset records some observations made in January and March showing the relatively low albedoes of the surfaces of Jupiter's first and third satellites. The disc of Ganymede when seen outside the planet was quite brilliant, but when projected on to the surface of the planet, during a transit, it became less and less bright until when near the central meridian it was very dark, in fact nearly as dark as its own shadow. This was observed on January 22 and March 12, and the same phenomenon, somewhat less marked, was observed in the case of the first satellite on March 27. As the satellites were projected on the bright equatorial band of the planet, it follows that the albedo of this region must be greatly superior to the albedoes of the two satellites.

A BRIGHT METEOR.—No. 4258 of the *Astronomische Nachrichten* contains a record of a bright meteor observed by Dr. J. Kaván at the Prag-Smichow Astronomical Institute on November 16, 1907. During its flight the meteor was seen to explode into two parts, but no trail, or detonation, was observed. The brightness of the object was about equal to that of Venus, and its flight, as observed by Dr. Kaván, was from $\alpha=196^{\circ}\cdot2$, $\delta=+57^{\circ}\cdot7$, to $\alpha=162^{\circ}\cdot9$, $\delta=+46^{\circ}\cdot7$; simultaneous observations by Herr L. Stetka gave approximately the same positions for the appearance and disappearance.

LATITUDE VARIATION.—When the international latitude service was instituted in 1899 the Cincinnati Observatory was asked to cooperate, and has made continuous observations since. As changes in the star-list were made in 1906 it seemed to Dr. Porter to afford a good opportunity to discuss the observations made to that date; this he does in No. 16 of the Publications of the Cincinnati Observatory, giving an historical account of the observations, a description of the instruments and methods used, and a table of the observed latitudes day by day. From the yearly values given it is seen that the different years show considerable fluctuations, signifying that the annual digressions are not symmetrical with reference to the determined mean position.